CLAIMS:

1. A method for determining a power of a laser beam which is adapted for determining a recording power of the laser beam to be projected onto a data rewritable type optical recording medium for recording data therein, which comprises steps of projecting the laser beam onto a first track, a second track and a third track in this order formed on the data rewritable type optical recording medium to be adjacent with each other while varying a level of the recording power of the laser beam, thereby recording a first test signal, reproducing the first test signal recorded on the second track, measuring, for each of the levels of the recording power of the laser beam, jitter JJ1 of the thus reproduced signal, reproducing the first test signal recorded on the third track, measuring jitter JJ0 of the thus reproduced signal, projecting the laser beam onto the first track and the third track y times where y is a positive integer, thereby directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, reproducing the first test signal recorded on the second track, measuring jitter $JJ(n + 1)$ of the thus reproduced signal where n is an integer equal to or larger than 0 and equal to or smaller than y, obtaining, for each of the levels of the recording power of the laser beam, a value of nc of n at which a function of a difference between $JJ(n + 1)$ and JJ0 becomes constant, determining the maximum value of nc as the number of times x of the direct overwriting required for saturating an influence of cross erasing of data on the first test signal recorded on the second track by directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a fourth track, a fifth

track and a sixth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a second test signal thereon, reproducing the second test signal recorded on the fifth track, measuring an amplitude A1 and jitter J1 of the thus reproduced signal, reproducing the second test signal recorded on the sixth track, measuring an amplitude A0 of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a first parameter as a function of a difference between the amplitude A0 of the reproduced signal obtained from the sixth track and the amplitude A1 of the reproduced signal obtained from the fifth track, directly overwriting the second test signal recorded on the fourth track and the second test signal recorded on the sixth track with the second test signal x times, reproducing the second test signal recorded on the fifth track, measuring an amplitude As and jitter Js of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a second parameter as a function of a difference between the amplitude A1 of the reproduced signal and the amplitude As of the reproduced signal, calculating a third parameter as a function of a difference between the jitter Js of the reproduced signal and the jitter J1 of the reproduced signal, obtaining a value of the first parameter corresponding to a value of the second parameter when the third parameter is equal to a tolerance, thereby determining a critical parameter, recording a third test signal in the data rewritable type optical recording medium while varying levels of the recording power of the laser beam, measuring, when signal characteristics of a reproduced signal obtained by reproducing the third signal recorded in the data rewritable type optical recording medium satisfy reference conditions, an amplitude AA0 of a reproduced signal obtained by reproducing the third test signal

before the third test signal is influenced by cross erasing of data and an amplitude AA1 of a reproduced signal obtained by reproducing the third test signal after the third test signal was once influenced by cross erasing of data for each of the levels of the recording power of the laser beam, calculating, based on the amplitude AA1 of the reproduced signal and the amplitude AA0 of the reproduced signal obtained by reproducing the third test signals, a fourth parameter as a function of a difference between the amplitude AA0 of the reproduced signal obtained by reproducing the third test signal before the third test signal is influenced by cross erasing of data and the amplitude AA1 of he reproduced signal obtained by reproducing the third test signal after the third test signal was once influenced by cross erasing of data, comparing the critical parameter and the fourth parameter, and determining the recording power of the laser beam at which the fourth parameter was obtained as an optical recording power when the fourth parameter is equal to or smaller than the critical parameter.

2. A method for determining a power of a laser beam in accordance with Claim 1, which comprises steps of setting the recording power of the laser beam to a predetermined level, sequentially projecting the laser beam onto a seventh track and an eighth track formed on the data rewritable type optical recording medium to be adjacent with each other in this order, thereby recording a third test signal thereon, reproducing the third test signal recorded on the seventh track, judging whether or not signal characteristics of the thus obtained reproduced signal satisfy reference conditions, changing, when the signal characteristics of the reproduced signal do not satisfy the reference conditions, the level of the recording power of the laser beam and recording the third test signal onto

the seventh track and the eighth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other until signal characteristics of a reproduced signal obtained by reproducing the third test signal recorded on the seventh track satisfy the reference conditions, reproducing the third test signal recorded on the seventh track and measuring an amplitude of the thus obtained reproduced signal, thereby obtaining the amplitude AA1, reproducing the third test signal recorded on the eighth track and measuring an amplitude of the thus obtained reproduced signal, thereby obtaining the amplitude AA0, and determining the fourth parameter as a function of a difference between the amplitude AA0 of the reproduced signal obtained from the eighth track and the amplitude AA1 of the reproduced signal obtained from the sixth track.

3. A method for determining a critical parameter used for determining a recording power of a laser beam to be projected onto a data rewritable type optical recording medium for recording data therein, which comprises steps of setting the recording power of the laser beam to a predetermined level, sequentially projecting the laser beam onto a first track, a second track and a third track formed on the data rewritable type optical recording medium to be adjacent with each other in this order, thereby recording a first test signal thereon, reproducing the first test signal recorded on the second track, measuring an amplitude A1 and jitter J1 of the thus obtained reproduced signal, reproducing the first test signal recorded on the third track, measuring an amplitude A1 of the thus obtained reproduced signal, calculating a first parameter as a function of a difference between the amplitude A0 of the reproduced signal obtained from the third track and the amplitude A1 of the reproduced signal

obtained from the second track, directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal predetermined times equal to a predetermined number of times x until an influence of cross erasing of data on the first test signal recorded on the second track has become saturated, reproducing the first test signal recorded on the second track, measuring an amplitude As and jitter Js of the thus obtained reproduced signal, calculating a second parameter as a function of a difference between the amplitude A1 of the reproduced signal and the amplitude As of the reproduced signal, calculating a third parameter as a function of a difference between the jitter Js of the reproduced signal and the jitter J1 of the reproduced signal, repeatedly performing the above identified steps while varying levels of the recording power of the laser beam by α within a predetermined range, calculating the first parameter, the second parameter and the third parameter for each of the levels of the recording power of the laser beam, obtaining a value of the first parameter corresponding to a value of the second parameter when the third parameter is equal to a tolerance, and determining the thus obtained value of the first parameter as a critical parameter.

4. A method for determining a critical parameter used for determining a recording power of a laser beam in accordance with Claim 3, which comprises steps of projecting the laser beam onto a fourth track, a fifth track and a sixth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a second test signal, reproducing the second test signal recorded on the fifth track, measuring jitter JJ1 of the thus reproduced signal, reproducing the second test signal recorded on the fifth track, measuring

jitter JJ0 of the thus reproduced signal, projecting the laser beam onto the fourth track and the sixth track *y* times where *y* is a positive integer, thereby directly overwriting the second test signal recorded on the fourth track and the second test signal recorded on the sixth track with the second test signal, reproducing the second test signal recorded on the fifth track, measuring jitter JJ(*n* + 1) of the thus reproduced signal where n is an integer equal to or larger than 0 and equal to or smaller than *y*, obtaining for each of the levels of the recording power of the laser beam, a value of *nc* of *n* at which a function of a difference between JJ(*n* + 1) and JJ0 becomes constant, and determining the maximum value of *nc* as the predetermined number of times *x*.

5. A data rewritable type optical recording medium recorded with a critical parameter used for determining a recording power of a laser beam, the critical parameter being determined by setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a first track, a second track and a third track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a first test signal, reproducing the first test signal recorded on the second track, measuring jitter JJ1 of the thus reproduced signal, reproducing the first test signal recorded on the third track, measuring jitter JJ0 of the thus reproduced signal, projecting the laser beam onto the first track and the third track *y* times where *y* is a positive integer, thereby directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, reproducing the first test signal recorded on the second track, measuring jitter JJ(*n* + 1) of the thus reproduced signal where *n* is an integer equal to or larger than 0 and equal to or smaller

than *y*, obtaining, for each of the levels of the recording power of the laser beam, a value of *nc* of *n* at which a function of a difference between JJ(*n* + 1) and JJ0 becomes constant, determining the maximum value of *nc* as the number of times *x* of the direct overwriting required for saturating an influence of cross erasing of data on the first test signal recorded on the second track by directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a fourth track, a fifth track and a sixth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a second test signal thereon, reproducing the second test signal recorded on the fifth track, measuring an amplitude A1 and jitter J1 of the thus reproduced signal, reproducing the second test signal recorded on the sixth track, measuring an amplitude A0 of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a first parameter as a function of a difference between the amplitude A0 of the reproduced signal obtained from the sixth track and the amplitude A1 of the reproduced signal obtained from the fifth track, directly overwriting the second test signal recorded on the fourth track and the second test signal recorded on the sixth track with the second test signal *x* times, reproducing the second test signal recorded on the fifth track, measuring an amplitude As and jitter Js of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a second parameter as a function of a difference between the amplitude A1 of the reproduced signal and the amplitude As of the reproduced signal, calculating a third parameter as a function of a difference between the jitter Js of the reproduced signal and the jitter J1

of the reproduced signal, and obtaining a value of the first parameter corresponding to a value of the second parameter when the third parameter is equal to a tolerance.

6. A data recording apparatus storing a critical parameter used for determining a recording power of a laser beam so as to be associated with ID data for identifying a kind of an optical recording medium, the critical parameter being determined by setting the recording power of the laser beam to a predetermined level, sequentially projecting the laser beam onto a first track, a second track and a third track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a first test signal thereon, reproducing the first test signal recorded on the second track, measuring jitter JJ1 of the thus reproduced signal, reproducing the first test signal recorded on the third track, measuring jitter JJ0 of the thus reproduced signal, projecting the laser beam onto the first track and the third track y times where y is a positive integer, thereby directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, reproducing the first test signal recorded on the second track, measuring jitter $JJ(n+1)$ of the thus reproduced signal where n is an integer equal to or larger than 0 and equal to or smaller than y, obtaining, for each of the levels of the recording power of the laser beam, a value of nc of n at which a function of a difference between $JJ(n+1)$ and JJ0 becomes constant, determining the maximum value of nc as the number of times x of the direct overwriting required for saturating an influence of cross erasing of data on the first test signal recorded on the second track by directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the

first test signal, setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a fourth track, a fifth track and a sixth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a second test signal thereon, reproducing the second test signal recorded on the fifth track, measuring an amplitude A1 and jitter J1 of the thus reproduced signal, reproducing the second test signal recorded on the sixth track, measuring an amplitude A0 of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a first parameter as a function of a difference between the amplitude A0 of the reproduced signal obtained from the sixth track and the amplitude A1 of the reproduced signal obtained from the fifth track, directly overwriting the second test signal recorded on the fourth track and the second test signal recorded on the sixth track with the second test signal x times, reproducing the second test signal recorded on the fifth track, measuring an amplitude As and jitter Js of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a second parameter as a function of a difference between the amplitude A1 of the reproduced signal and the amplitude As of the reproduced signal, calculating a third parameter as a function of a difference between the jitter Js of the reproduced signal and the jitter J1 of the reproduced signal, and obtaining a value of the first parameter corresponding to a value of the second parameter when the third parameter is equal to a tolerance.

7. A data recording apparatus storing an optimum recording power of a laser beam so as to be associated with ID data for identifying a kind of an optical recording medium, the optimum recording power of the laser

beam being determined by setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a first track, a second track and a third track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a first test signal, reproducing the first test signal recorded on the second track, measuring jitter JJ1 of the thus reproduced signal, reproducing the first test signal recorded on the third track, measuring jitter JJ0 of the thus reproduced signal, projecting the laser beam onto the first track and the third track y times where y is a positive integer, thereby directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, reproducing the first test signal recorded on the second track, measuring jitter $JJ(n + 1)$ of the thus reproduced signal where n is an integer equal to or larger than 0 and equal to or smaller than y, obtaining, for each of the levels of the recording power of the laser beam, a value of nc of n at which a function of a difference between $JJ(n + 1)$ and JJ0 becomes constant, determining the maximum value of nc as the number of times x of the direct overwriting required for saturating an influence of cross erasing of data on the first test signal recorded on the second track by directly overwriting the first test signal recorded on the first track and the first test signal recorded on the third track with the first test signal, setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a fourth track, a fifth track and a sixth track in this order formed on the data rewritable type optical recording medium to be adjacent with each other, thereby recording a second test signal thereon, reproducing the second test signal recorded on the fifth track, measuring an amplitude A1 and jitter J1 of the thus reproduced signal, reproducing the second test signal recorded on the sixth track,

measuring an amplitude A0 of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a first parameter as a function of a difference between the amplitude A0 of the reproduced signal obtained from the sixth track and the amplitude A1 of the reproduced signal obtained from the fifth track, directly overwriting the second test signal recorded on the fourth track and the second test signal recorded on the sixth track with the second test signal x times, reproducing the second test signal recorded on the fifth track, measuring an amplitude As and jitter Js of the thus reproduced signal, calculating, for each of the levels of the recording power of the laser beam, a second parameter as a function of a difference between the amplitude A1 of the reproduced signal and the amplitude As of the reproduced signal, calculating a third parameter as a function of a difference between the jitter Js of the reproduced signal and the jitter J1 of the reproduced signal, obtaining a value of the first parameter corresponding to a value of the second parameter when the third parameter is equal to a tolerance, thereby determining a critical parameter used for determining the recording power of the laser beam, setting the recording power of the laser beam to a predetermined level, projecting the laser beam onto a seventh track and an eighth track in this order formed on data rewritable type optical recording medium to be adjacent with each other, thereby recording a third signal, reproducing the third test signal recorded on the seventh track, judging whether or not signal characteristics of the thus reproduced signal satisfy reference conditions, changing, when the signal characteristics of the reproduced signal do not satisfy the reference conditions, the level of the recording power of the laser beam and recording the third test signal onto the seventh track and the eighth track in this order formed on the data rewritable type optical recording medium

to be adjacent with each other until signal characteristics of a reproduced signal obtained by reproducing the third test signal recorded on the seventh track satisfy the reference conditions, reproducing the third test signal recorded on the seventh track and measuring an amplitude of the thus obtained reproduced signal, thereby obtaining the amplitude AA1, reproducing the third test signal recorded on the eighth track and measuring an amplitude AA0 of the thus obtained reproduced signal, determining the fourth parameter as a function of a difference between the amplitude AA0 of the reproduced signal obtained from the eighth track and the amplitude AA1 of the reproduced signal obtained from the sixth track, comparing the critical parameter and the fourth parameter, and obtaining the recording power of the laser beam at which the fourth parameter was obtained when the fourth parameter is equal to or smaller than the critical parameter.